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ABSTRACT

Organizational change in college academic administration and structure is discussed, with attention to both the programs of study and the organizational units. The ideas of Miles and Snow on organizational adaptation are examined, along with the literature on organizational analysis in higher education over the past 20 years. Three main ideas of Miles and Snow are: organizations act to create their environments; management's strategic choices shape the organization's structure and process; and structure and process constrain strategy. They also identify three types of universal problems and offer four oganizational models for how management addresses these problems: defenders, prospectors, analyzers, and reactors. Patterns found in four studies primarily in the 1970s include: a focus on internal administration, and concern for how the college should react to the external environment. Attention is directed to the disciplinary department and adaptive mechanism such as new departments, "super departments" (biotechnology), the "school" solution, and special facilities such as institutes. Additional developments include new programs of study, joint degree programs, nondepartment degree programs, and highly specialized degrees. (SW)

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DOING THE RIGHT THING: PROBLEMS OF ACADEMIC ORGANIZATION

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Center for the Study of Higher Education

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A - INTRODUCTION

Organizational invention is a distinctive tradition in American social history, highly valued and often used. Indeed, Alexis de Tocqueville in the course of his travels around the new republic in the 1830's remarked on the special place and power that creating new "associations" --we would label them organizations today--held in the community and national life of the United States (Mayer, edit. 1971).

In contrast to the notion of "reform" which appears often in the literature of higher education in the Old World, the watchword of improvement, or even better, progress, in this country has been and is organizational change. Whether by the invention of new forms, and we have the junior-community colleges or the graduate school as standing examples, or by major restructuring as is the case with the transformation of teachers colleges, the inventive route of organizational change is the one we favor. While the age of the enterprise may at first appear to be the discriminant factor the late Joseph Ben-David pointed out how deeply rooted it is in academic culture (Ben-David 1971).

The structure of an organization may be seen as an expression of the coalignment between enterprise and environment. The argument developed here is that the means to coalignment for colleges and universities is changing. Evidence of structural response is found in both the programs of study and the organizational units.

What necessity mothers this inventiveness? A useful tool for analysis is available in an approach to organizational adaptation of Miles and Snow (1978). They fix the central task of managers to be "...maintaining and improving (the) coalignment of environmental and organizational variables ..."

Challenges arise "because each set of variables changes according to its own dynamics." In meeting the challenges an organization tends to focus on either "doing things right" or "doing the right things". In the first instance the focus is on operations, their efficiency and orderliness. In the second more attention is given to searching out what the environment calls for. In the realm of higher education nowadays the application of this distinction stimulates some insights about the kind of transition surrounding us. There is evidence, we believe, that after about three decades of attention to "doing things right" the colleges and universities of the US are thinking more about "doing the right things".

The evidence that signals such a change is found mainly in the structural inventions being made to improve the central functions of instruction, research, and certain kinds of service to society. These structural changes tend to appear in areas of academic administration and operation rather than in the realm of institutional administration which has received so much of the attention in the recent past. They demonstrate considerable ingenuity and a refreshing variety, features that have been overlooked by the critics preoccupied with decline and retrenchment.

Joining these ideas we can hypothesize that if higher education is giving more attention to "doing the right things" as that concept is developed by Miles and Snow then the newer patterns of organization will display different structural forms and a different kind of relationship to the external environment. Only by a large scale analysis can this assertion be fully tested. What follows here is a first look at some of the forms the coalignment takes, a test of the validity of the idea. We begin with a more detailed look at the Miles and Snow formulations. Then there is a brief consideration of organizational analysis in higher education over the past two decades. We turn next to information on modifications to units and programs gathered by participant

observation, telephone interviews, and catalogues. In summary a set of conclusions and inferences is presented.

The material is bound to be tentative and some of the reasons lie more in the conditions of higher education than in the data. To expect sharp boundaries and absolute trends across the postsecondary sector today on any thesis is fatuous. The best we can anticipate are telltale threads in the winds of change. There is, for example, no singular demographic dynamic at work for all institutions in all regions (McConnell & Kaufman, 1984). Neither is there a set of federal policy banners that give priorities for institutional enactments. The serpentine "academic procession" in which each articulation is a slightly dimmer version of Harvard or any "college of your choice" is long gone. Three Thousand Futures, the ecology so well described by the Carnegie Council, presents an environment in which change comes by hundreds of evolutionary decisions and the evidence must be read by interpretation (1980). It is in this setting, differentiated, self-determining, interactive, and made somewhat turbulent by waves of critical reports, that decisions made about academic structures and programs take on new importance.

B - ORGANIZATIONAL ADAPTATION: A CONCEPTUAL BASE

The advantages of applying the Miles and Snow ideas on organizational adaptation extend well beyond the synoptic contrast provided by the phrases used in the introduction, "doing things right" and "doing the right things". They have a fully developed rationale. Three "pivotal ideas" (p.5-8) on which they base their constructions are easily transposed to higher education as are the classic "problem" sets they identify. The management models do not fit exactly niche to node with higher education but two are instructive. Since the authors' intent is "to provide a means by which scholars and managers can describe, discuss and increase their understanding of dominant behavioral

characteristics of. . .organizations" (p.166) the application here is consistent with the purpose of the formulation.

Turning to the specifics of Miles and Snow: Three "pivotal ideas" are abstracted from recent writings on organizations.

(1) "Organizations act to create their environments". The degree and level of enactment varies in higher education, particularly between public and private institutions, but how each reads the environment is a source of the diversity that we consider an asset.

(2) "Management's strategic choices shape the organization's structure and process". This precept sees organizational structure to be ". . .only partially preordained by environmental conditions. . .with a heavy emphasis on the role of top decision makers who serve as the primary link between the organization and its environment." To make this notion fit higher education requires two rather basic transpositions. "Management" exists in at least two forms. Administrative management which holds responsibility for the institution, the "firm" if you will, and academic management by which the faculty apply their specialized expertise to shape and direct what Clark (1983, p.8) has aptly titled "the academic forces of production". Faculty "manage" in the most fundamental sense by designing and conducting the curriculum, by selecting and pursuing research topics, and by making selective liaison with the outside community. Today they also hold the key to strategic choice. It was the Yeshiva opinion, as much as anything, that served to remind us of the dual management structure in education (Yeshiva, 1979).

(3) "Structure and process constrain strategy". Nearly a truism this idea needs no elaboration although the question of how independent strategic choice may be from environment continues to spark debate (Hrebiniak & Joyce, 1985).

Miles and Snow postulate three universal "problem" sets: The "entrepreneurial" problem deals with the choice of market and product, issues thoroughly familiar in the context of enrollment management (Hossler, 1984). The "engineering" problem engages questions of technique and operations. Again analogies are apparent in higher education as we consider the place of computers, telecommunications, and the investment costs they present. The "administrative" problem involves the selection of priorities and actions that encourage a rational view of the total enterprise.

Miles and Snow offer four organizational models based on how these problems are addressed by management: DEFENDERS, PROSPECTORS, ANALYZERS, and REACTORS. Given the evidence at hand it appears that higher education is moving from a DEFENDER orientation into an ANALYZER condition, at least in academic administration.

DEFENDERS tend to see narrow, stable domains to both markets and products. The manager's primary role is to protect those domains. A good deal of effort goes into improving the way things are done to give a "lean and efficient" organization. Management cultivates an ". . .ability to control all organizational operations centrally" with an emphasis on planning and formal structure. "Doing things right"- problem solving rather than problem finding and using the sequence PLAN-ACT-EVALUATE are the characteristics of DEFENDERS. The organizational structure favors grouping specialists into departments and carrying out extensive division of labor. Evaluation is conducted by comparing present performance to past events, a sort of self-study. Much of this thinking is developed richly in the metaphorical mode put forward by Morgan in his recent work (Morgan, 1986).

ANALYZERS face mixed markets some of which are stable and others uncertain or undefined. The product picture is equally mixed with some stable

lines and some developing items. The managers must move in two climates, one of stability, the other of change. The engineering problem calls for a dual technology that keeps what is working well in place but at the same time moves quickly to new areas. Administration requires a coordinated view of the disparate functions and therefore tends to build a broad collaborative base for decisions. Leadership may originate from any of the divisions, marketing, technical, or engineering. The organization is constantly scanning the environment and assessing external relationships to make sure it is "doing the right things". A mixed planning process obtains but evaluation is the first step, not the last. All this leads to a differentiated structure with different kinds of units with different modes of operation. Control is based on a variety of factors; priorities, opportunities, technical needs rather than on a single line such as the budget. Again the ideas of Morgan (1986, p.12) emphasizing the managerial skill to read the environment and hold ". . .a capacity to remain open and flexible" fit the analyzer style.

C - ORGANIZATIONAL ANALYSIS IN THE LITERATURE OF THE SEVENTIES

Miles' and Snow's three pivotal ideas will serve in a brief analysis of the development of the administrative and organizational literature in higher education over the last two decades. In order to select a strong sample of related literature we focus our analysis in five selections which have appeared at least twice in four different studies regarding higher education recommended literature (Bender & Riegel, 1973; Drew & Schuster, 1980; Reid & Goetz, 1982; Weidman, Nelson & Radzyminski, 1984). The five selections are: Balderston (1978); Baldridge (1971) and Baldridge et al. (1978); Cohen & March 1974); Corson (1960) (1975); and Mortimer & McConnell (1978).

It is possible to establish some common patterns in the selected literature with respect to the three above mentioned pivotal principles.

1. The main focus of these books is the internal administration, governance, or management of higher education institution and they highlight either descriptive peculiarities or normative characteristics.
2. In any of the books there is an explicit concern for how the institution should react to the external environment. When the environment is treated, it is treated as something that alters the normal life of the institution, as an intrusive phenomenon which requires an institutional response. It is rarely treated as a challenging phenomenon which requires an adaptive coalignment or collaborative effort to alter environmental factors. So while the literature of the seventies appears to be sensitive to the external environment the responses proposed are largely reactive and within the closed system of the institution.
3. The organizational structure and process are mostly analyzed from a rational bureaucratic point of view, either to criticize the excessive bureaucracy or to identify how things really function or should function in a political, academic, organized anarchy, or shared authority setting. It is seldom related to institutional exchange with the environment. When it is, exchange is not presented as a result of an organizational strategic choice.
4. Probably the main theme of some of the above mentioned selections is not that structure and process constrain strategy, but that structure and process constrain the internal development of the institu-

tion. In other words, the emphasis is on how they could limit the institution in "doing things right."

Most of the predominant ideas in that literature correspond to "internal purposive models" as Peterson (1985) has described the pre-1974 ideas; but they are basically concerned with individual, coalitions or subunits not with the total organization (Pfeffer, 1982). When the focus is on the total organization, the ideas seem to assume an "externally constrained" situation according to Pfeffer's classification. One particular case is the Cohen and March book. These authors are classified by Pfeffer as interested in the total organization, within a model of decision process that includes some aspects of the social construction approach.

Nevertheless, none of the selections adopted an approach similar to Miles and Snow's: purposive and engaging the environment at the organizational level. However, a more recent selection of the higher education administrative literature, Keller's Academy Strategy, for example, does address the issue as he states:

> "Academic strategic decision making means that a college, school, or university and its leaders are active rather than passive about their position in the history. (p. 143)"

The great attraction of this work is the new way it proposes to look at the external world and interest with it. The "active" mode is also reflected in the use of environmental scanning by institutions (Callan, 1986).

More recently, Chaffee (1985) has described three different, although not necessarily independent, models of strategic management. The first model, the linear model, emphasizes forecasting and the belief that the achievement of organizational goals is the aim of the strategy. The second model is adaptive strategy, which correlates closely with the description of strategy as presented by Miles and Snow, and by Keller. Finally, she describes interpre-

tive strategy, a model which is "based on a social contract, rather than an organismic view of organizations" (p. 143) and which emphasizes the symbolic actions and communication. Perhaps the most important aspect of the "interpretive strategy" is Chaffee's finding that is better to use this type of strategy in addition to an adaptive strategy than just an adaptive strategy alone (1984). These observations fit well with the ANALYZER model of Miles and Snow. Such a necessary change in organizational perceptions has also been proposed by Gioia and Chittipeddi (1986) who related it to the strategic changes and restructuring of a major research university. It is interesting to mention that while Miles and Snow (1978, 1986) have connected a "mixed" or "matrix" structure to an ANALYZER type of institution, other authors have emphasized the symbolic part of that type of structure by talking of a "matrix management's culture" (Kenzner & Cleland, 1985; Bess, 1982).

It is obvious that new views are emerging on how higher educational institutions interpret and use the environment. Collaboration with the factors in the environment and interpretation of that coalignment are replacing simple reactive responses once taken to modify the internal organization in the name of efficiency. The instruments or devices invented to enhance coalignment are also changing.

D - OLD DEPARTMENTS AND NEW ENVIRONMENTS

In the minds of most practicing academics there is a reasonable and ordered view of the enterprise. At the hub is the disciplinary department. Because senior scholars have all been selected, trained, and certified in the department setting that concept holds considerable normative power. Analysts at work on the mystery of academe over thirty years, at least, have confirmed departmental power (Wilson, 1942) (Caplow & McGee, 1958) (Hagstrom, 1965)

(Blau, 1973) (Dressel, Johnson & Marcus, 1970). Even contemporary research incorporates observations on an artifact that endures (Bowen & Schuster, 1985) (Finkelstein, 1985). By means of comparative studies Clark (1983) has carried systematic analysis to more complex levels. The "enterprise", the level of the institution, and the department are anchor points. Intermediate level structures, colleges, faculties, schools, and divisions are widespread but variable in nature. The discipline-based department with its "knowledge-bearing" qualities stands at the heart of the enterprise, the system, and the profession. It is the essential locus of tasks, beliefs, and authority.

Part of the centrality arises because of the functions carried out in departmental settings. Ikenberry and Friedman (1971) saw that "the multi-functional character of the academic department is its most distinguishing quality. . ." They are administrative entities, cost centers in the budget picture, communication nodes, personnel clusters, authority and planning units. In short, a nice bureaucratic unit whose boundaries correspond with the discipline or field. But they are more; the collegial unit which by intellectual affinity conveys a sense of belonging. At their best departments are the ground for intellectual give and take that stimulates creativity and sustains integrity. Common professional values, expert knowledge and technique, along with a sense of primary peerage are there. Then there is the important and often troublesome complex of educational functions. At least one institution uses the descriptor, "Departments of Instruction" in its catalogue (Arizona). Determining what is to be taught, how it is to be organized for instruction (less often for learning), indicating the acceptable methods of presentation are department functions. Negotiation for a position in the curriculum and other propagation of group interests are the department responsibility.

The disciplinary department in its most developed form presents a remarkable concentration of resources, control, and administrative convenience. Carried upward to the level of the college, school, or faculty these functions become the substance of an ideal-typical pattern in the Weberian sense that effectively couples bureaucratic and collegial features.

In other times, not too long ago, the disciplinary department was also the vehicle and instrument for organizational change. Ben-David (1971) described the great advantage that came from the American ability to start new departments as knowledge changed while European institutions were hobbled by the department-professor-institute structure. Blau (1973) maintained the institutionalization of new knowledge could be achieved by creating new departments. "By establishing departments in new specialties, an academic institution keeps abreast of recent scientific and scholarly developments and institutionalizes the pursuit of new knowledge" (p. 198).

However, serious disadvantages to creating new departments in order to meet the differentiation of knowledge and technology became very clear before 1960. To begin with departments are so permanent. Once a commitment is made to personnel, space, special facilities, a place in the organizational structure and a stake in the curriculum there is no turning back and very little room for adjustment. Costs at every turn are high and continuing with little prospect of revenue return to ease them. Perceptive leaders and a few scholars understood the dilemma: "How can the resources and advantages lodged in the departments (and their faculty members) be applied more flexibly and efficiently?"

Abolishing departments looked attractive (Hungate, 1964). Curbing their power seemed necessary (Dressel et al., 1970). Creating institutions with non-departmental structures, sometimes "colleges" of a residential nature, some-

times generalized "divisions", enjoyed a decade of attention. Within universities the introduction of "colleges" without disciplinary departments, Colleges of Human Development at West Virginia and Penn State, was tried and most are now history.

The search for organizational inventions that can tap into the resources concentrated in departments without replicating the disadvantages continues. This gives a convenient benchmark against which certain aspects of structural change can be assessed. By comparing new units and programs to the ideal-typical model of the disciplinary department we get a sense of direction. If departments can't be adjusted to "doing things right" then the exact nature of the "right things" deserves to be looked at.

It is also appropriate at this point to ask what there is about the contemporary environment that stimulates the shift from "doing things right" to "doing the right things." One collection of changed conditions is found in the market domain, the utility of knowledge. New knowledge has a much higher market value and this has promoted research and development on technique, application, and problem-solving. As mission-oriented research increased it became necessary for academics to look at issues from the sponsors' perspective rather than or in conjunction with their own. The market has made its influence felt through labor force requirements as well. In 1960 there was a large demand for people in professions and occupations that were similar to the academic world. Teachers and professors, human service fields, research specialists in all fields; the training of individuals who tended to be "academic clones" responded to this demand. But there has been a major labor market shift evident at every degree level. Undergraduates have elected business, engineering, nursing, forestry, and computer science. Masters degrees have become more popular and more specialized. Doctorates in the

disciplines have slipped downward and the professional schools thrive. To meet these conditions institutions, and even more, departments must read the environment and achieve collaboration with practitioners.

The second environmental shift is found in knowledge itself and the way it is applied. Once the academic structure, the pattern of the disciplines, was a suitable analog to the real world. Training in, let us say, physics led to employment as a "physicist" and everyone knew what that meant. But the world has steadily moved toward its own structure of knowledge, a structure built around problem solving, task performance, directed development, and technological advancement. Once the world was seen as a mirror image of the academic disciplines. Now, as the Dean of a Communications School put it, "we are seeking to build in the school a mirror of the complex world of communication." Once theory neatly preceded application and technology. Now we see cases where technology is an heuristic force in the generation of theory (Toombs, 1986).

These are ideas that need much more examination but the main outline of a changed environment is clear. In training and in the consolidation of knowledge the disciplinary structure remains viable. Application of knowledge in the world, on the other hand, is generating another epistemology organized around utility, competence, and technology rather than theory. The issues and problems are complex and specific to situations or fields of action so they present new patterns of demand on academics, patterns that are better addressed by academic administration than by institutional management. As we look at the inventions for adaptation that are now appearing both the rigid nature of the disciplinary department and the new features of the environment must be kept in mind.

E - THE DESIGNS AND FORMS OF ADAPTATION

1 - The Source of Information for these interpretations and much of the stimulus as well came from several sources. For a close-up view our home institution, Penn State, provided a rich environment. Strategic planning, energetic academic leadership, and special study groups have led to changes in the academic structure and programs. Similarly, advisory relationships with the collegiate institutions, one with a public, regional and comprehensive orientation, the other with a private technical tradition, turned up a strong demand for academic organization. To broaden the base we looked at the current organizational structure of fifteen mid-size institutions then turned to ten public research universities. After examining the catalogue data we asked the senior academic officer at each university for a brief update covering the past three years.

There is a great deal going on. In the research universities much inventive action has been taken. The smaller comprehensive institutions are deeply engaged in discussion and speculation but very cautious in undertaking structural changes in either units or programs.

2 - Organizational Units

a) New departments: In some situations, now more narrowly proscribed than ever before, the creation of a department is still the best answer. From the heyday of the new department, late fifties and early sixties, there are durable survivors. Ecology, for example, survived and is still being picked up as a new department while "environmental studies" is not. Genetics, linguistics, toxicology are spin off disciplines now at most of the ten research universities we examined. Illinois has just established an independent statistics department after "incubating" the discipline as a

division in the mathematics department for a long time. American Studies and Comparative Literature are subfields that are appearing as new departments (Oregon, Penn State).

In other cases which at first glance look like mere name changes turn out to be a realignment of the department with the external situation; Food Science became Hotel and Restaurant Management at Georgia. Mixed fields like textiles, furnishings, and fashion are becoming departments of Design.

b) "Super departments": This may not be the best label, given the nature of academic sensitivity to prestige but it is an accurate descriptor for one set of organizational units. Certainly one early expression of the phenomenon was the establishment of "materials science" units in the late fifties and early sixties. Even today new materials science institutes are being created e.g. Oregon. The most visible current focus of super departments is biotechnology found as departments, e.g. Penn State, or as institutes or centers. Similar organizational units have been created for the geosciences (Oklahoma), Cellular and Molecular Chemistry (or Biology) Neural Sciences and Behavior (Massachusetts).

In the non-science areas some of the super departments are consolidations of the older area studies programs which tended to slip away a federal funding waned then expired or of long standing faculty interest. The department of Judaic-Middle Eastern Studies (Massachusetts) or Latin American Studies (Georgia) are such manifestations.

Super departments are notably multi-disciplinary. However the combination of disciplines is not always what academic purists would prefer neither is the form of their combination. In academic circles the notion of "interdisciplinarity" enjoys a certain vogue. The subtleties of terminology are worth noting. Interdisciplinary connotes an equality among members and

suggests no compromise with disciplinary identity. It also has a tentative air, as if the agreement can be abrogated at any time by unilateral action. None of that is characteristic of these super departments. Sometimes they engulf entire departments in their creation. More often they extract one or more subspecialties from a classical discipline and set them in a new context. Biotechnology is made up of biochemists, biophysicists, molecular specialists, geneticists, really a varied collection of subdisciplines determined by the nature of the institution coupled with external factors. Super departments are a product of collaboration, usually explicit but sometimes unconscious, between external interests, disciplinary specialists, and academic leadership at the institutional level. The opportunity to exert such creative and significant leadership even though it is heavily collaborative and made complex by the diversity of interest makes the role of senior academic officer more challenging today than it has been for two decades. External interests are no longer confined to federal sponsors. Industry, private donors, state and regional constituencies, as well as professional bodies are likely to see applications or consequences from a superdepartment.

c) The "school" solution: Within the university it is the colleges, their deans and departments, that constitute a powerful conservative force. They exist in a complex state of equilibrium that can easily accommodate only a few kinds of change. Social transformations today present many opportunities as well as demands that cannot be answered by creating a new department or even a super department. The nature of global economics, multi-media telecommunications, computer based information processing and similar phenomena call for an unusual scale of organizational responses.

One option is to create a "school", sometimes within a college, sometimes free standing. Most often they are, in a sense, colleges without departments

but with a dean, a name, programs and identity. It can be a device for anticipating or cultivating funding or other support from external sources. The creation of schools illustrates in some ways the kind of organizational learning or evolution reported by Argyris and Schon (1978). Noted earlier were the largely unsuccessful attempts to get along without departments. The creation of schools and most of the other adaptive devices we have discussed offer a way of respecting the powerful ethos of the disciplinary department while still drawing off some share of the departmental talent and casting it into new programs. Support for a school and its activities can be targeted much more precisely on a set of goals which might never attract consensus within a department or a college.

Experiences at two institutions illustrate different facets of the "schools" virtues. At a mid-size comprehensive state university (10,000 students) a consolidation in 1979 created two major units, Faculty of Arts and Sciences, and a Faculty of Professional Studies. It gave very little happiness to the "old guard" who remembered the teachers college era when specialized schools of music and health education brought identity and a sense of distinction. Neither did the professional studies idea yield the flexibility for undertaking new programs in higher demand fields. By 1985 it was clear that academic reorganization had to be done. The faculty committee, ably chaired and well supported by institutional research, first ventilated all the objections, personal and political, looked at other institutions and some plausible alternatives and then laid out a design. The classical disciplines had the fewest problems so they were continued in a College of Arts and Sciences.

Schools were introduced partly to honor tradition, the School of Music is an example, and partly to open pathways to new development, Business and Public Affairs or Health Sciences. The college-school mix is in fact a modified matrix design. School units are better prepared to read the specialized sub-environments in which they operate. Program initiation which was cumbersome in the extreme under the two college organization can become simpler. Of course, a great deal of responsibility for reconciling the stable markets and products of the traditional Arts & Sciences with the dynamic conditions in the Schools rests with the senior academic officer, in this case a provost.

A different genesis for a School of Communications is found in the experience at Penn State. After about two years of study it was concluded that a unit was needed to mobilize an unusual body of faculty talent in ways that would relate to the corporate consolidation and media diversification taking place so rapidly in the field of practice. A school with degree programs at all levels and an active commitment to research and service was created sans departments. The programs in all aspects of mass communications, film, print, radio, TV, are developed around a a mixture of application and technology on the one hand and a theoretical view on the other. The values and philosophy, still forming, are different from those held in the traditional departments in which the school participants hold their academic appointments. Whether and how well this life in two cultures will work out remains to be seen. What is clear, however, is that students, practitioners, and corporate performers see the concept as very worthwhile.

Another school-type design has been created in the form of a Division of Technology. Within the multi-campus Penn State system associate degree programs in the technologies were sought by students and employers. The College of Engineering and the College of Science are heavily engaged with

research and advanced level education so it was inevitable that technology programs could not receive the developmental attention they required. The Division will construct programs by drawing faculty talent from regular departments and from the field as well.

The boldest creations in the school format are those which reach across institutions. The Oregon Council for Advanced Technical Education (OCATE) offers courses in high technology fields at the advanced level to scientists and engineers. An Oregon Executive Management program which draws faculty talent from Oregon State and Portland as well as the University of Oregon certifies an MBA. University of Massachusetts has a similar "external" degree in Engineering Management.

The versatility of the school concept is demonstrated not only by the establishment of such units but also by their disestablishment. Illinois reviewed the schools within two of their colleges. The schools of social sciences and humanities were disbanded largely because they were units of internal convenience rather than instruments of response to the environment. At Penn State two colleges, Human Development and Health, Parks, and Recreation, are in the process of merging. Part of the purpose is to consolidate certain fields of study like justice administration into the appropriate academic context but more important is the need to better align health and human service areas with the external environment. In fact the whole area of transformation within the fields of health education and fitness in conjunction with changes in the social environment toward wellness and positive health is a study in itself.

d) Special Facilities: Of all the adaptive mechanisms discussed in this paper it is the "organized research units", ORU's, in the form of institutes, centers, laboratories and field stations that have had the greatest

attention in the literature. This is not surprising because one of the purposes in creating them is to increase visibility of a particular activity. These units, "beyond departments", to use their terminology, were studied in 1971 by Ikenberry and Friedman then examined in a broader setting by Friedman and Friedman some ten years later (1982). They found several distinctive and persistent features: "Institutes tend to be organized around tasks that may involve more than one discipline . . ." "Much of the initiative has come from outside the university particularly the federal government. . ." The organizational structure tends toward ". . .standard, shallow, adaptive, models." (1971) Similar findings mark the later report and they are well summarized by comparing the characteristics of ORU's against the normative structure and value pattern of the academic core (1982).

Since the creation and expansion of the centers and institutes idea continues one is led to ask whether the negative valences in that comparison are not positive virtues in relating the university to external interests. For example the fact that these units are "not central to the definition of a university" and are "perceived as marginal" may be an asset. At the boundary layer between the academic community and let us say industry that position is exactly the right one. Or take the point that they "often lack intellectual cores." What appears to happen in many cases is that the unit by a combination of technology and application is seeking out what an appropriate intellectual or theoretical orientation should be. Narrowness can be read as concentration and focus. Shallowness may reflect openly the tentative nature of knowledge in a particular context. The accountability these units hold to external sponsors and to the university insures effective use of resources if evaluation and surveillance is carried out.

It may be that the simpler explanation is more accurate. The number of ways in which external agencies, public and private, business and non-profit, can turn benefits from affiliating with the knowledge base in university centers has increased. At the same time universities are finding new ways of using this organizational invention. There is clearly an interest in linking the activities into instructional programs, not only at the graduate level but by intermittent job experience at the baccalaureate level. Sharing equipment and supplies, always an important part of the exchange has increased in value. Supplementing faculty resources with specialists from research fields is common. University policies for managing these units to maximize flexibility improved after the growth of funding slowed. These centers and institutes remain one of the best ways to reach across departments to marshal specific talent, one of the best ways of getting visibility, and one of the best ways to try new activities without excessive investment.

Affirmation for some of these features comes from the ten universities we looked at. Oregon has instituted an International Center for Sport and Human Performance. They have had a Solar Energy Center and a Center for Theoretical Science, the latter pointing up the internal value to the construct. Arizona has a large number of centers and the dates they were set up is an excellent reflection of conditions and demands in the environment. For example, Educational Research and Development came into being in 1971, the Center for Higher Education in 1978 and the Educational Evaluation and Measurement unit in 1980. One could scarcely find a clearer evidence of response to the environment. The Poison and Drug Information Center dates from 1980 while Remote Sensing goes back to 1972. The University of Georgia with fifty centers is evaluating each unit against criteria that include cross disciplinary qualities, support for programs of study, and visibility in the field. North Carolina makes the

policy statement explicit: "These institutes do not operate as instructional agencies within the university; rather, they serve to obtain financial and organizational assistance for the scholars who constitute their membership." (North Carolina 1985-86) Other institutions, however, are incorporating more aspects of the learning programs into the centers.

Among the more exciting developments in the special facilities is the recent creation of major organizational units that bring together groups of multi-disciplinary institutes and centers. The University of Illinois is establishing the Arnold and Mabel Beckman Institute for Advanced Sciences and Technology. The disciplines and interdisciplinary units concerned with the cognitive sciences and artificial intelligence will participate. When one realizes that Illinois also has a National Center for Supercomputing the enormous potential of multiplex centers becomes apparent. The Beckman Center was sparked by a generous gift. A senior faculty group came up with alternate ideas and the Vice President for Academic Affairs contributed the final design. This is a fine illustration of how collaborative leadership achieves effectiveness in "doing the right things".

At the University of Georgia two very similar large scale multidisciplinary complexes are being constructed. Centers for Advanced Computing Methods, Applied Isotope Research, Ultra-structural Research, and Plant Cellular and Molecular Biology are brought together in a Biotechnology Center. In quite a different area a Center for International Mass Communication is drawing together units from business, area studies, and communication.

These new mega-units are very different from the units that make up the academic hierarchy, departments, divisions, and colleges. While the full implications are not at all clear it looks as if a parallel organizational structure is emerging in universities to meet contemporary conditions in the external environment.

3 - Adaptive Programming

a) The invention of new programs of study, whether at the degree level or through some other kind of certification, is a very flexible adaptive device. The process is going on without much general notice. The virtues of this approach begin with the fundamental faculty interest in which they are often rooted. Ambitious administrative structures are seldom anticipated and the strength of student and market interest is tested without large investment. It appears from our limited data that institutions find a program design that works for them then use it again and again.

b) Joint degree programs offer a very promising and effective way of tying theory and practice, academe and the market, together. Effective programs with high utility take some planning illustrated well by the University of New Mexico programs in comparison with conventional approaches. In the latter case one simply fulfills the requirements, all of them, for both degrees. Well conceived joint programs, typically masters level, recognize the particular utility that is the goal, acknowledge and remove redundancies, provide for direct supervision and arrange certification. New Mexico has joint programs in law and management, J.D. & MBA, law and public administration J.D. & MPA, and business & computer science, MBA & MS. For many universities joint certifications open a new way to answer a market need without major alteration or investment.

c) "Non-department" degree programs: The variations on this theme are so many that a simple positive descriptor is not possible. At most good graduate schools it has always been possible to construct an individual multidisciplinary program of study, possible but seldom worth the effort. A class of degree programs that have a basic design, use resources from several departments, and arrange coherent supervision have grown up.

At North Carolina they are designated "curriculums" in the graduate catalogue and they operate under an "advisory committee." The University of California at Davis has a total of 19 programs designated as "group" programs. "A group is a self-governing organization of faculty members formed for the purpose of sponsoring a graduate degree program which may be either disciplinary or interdisciplinary. The graduate group concept offers flexibility for the development of interdisciplinary programs and for faculty to participate in more than one graduate program . . . The membership may transcend school, college and departmental boundaries and is sponsored by the departments of the participating faculty members." (University of California, Davis, Graduate Announcement 1985-86) The only part left unsaid is the capacity of the group structure to meet specialized needs such as: International Agricultural Development, Water Science, Agricultural and Environmental Chemistry, Applied Mathematics.

At Massachusetts the Deans of Natural Science and Social Science oversee two new programs delegating the operations to program directors and an advisory board. The doctoral degrees are in Molecular and Cellular Biology and Neural Science and Behavior. Some institutions, Oregon is one, operate such committee based programs at the masters level. Georgia has 3 such programs in Animal Nutrition, Ecology, and Linguistics.

Illinois has within the School of Humanities a "Unit for Cinema Studies" and a "Unit for Criticism and Integrative Theory" conducting programs of study.

At Penn State there are twelve such programs, all offering masters and doctors degrees. Called Intercollege Degree Programs they include Acoustics, Bioengineering, Ecology, Genetics, Physiology, and Solid State Science along with a group now being formed into a single nutrition program. The Acoustics

program is among the oldest, established in 1965 in a research setting that already had a twenty-five year track record. In many ways it stands as an example of a well founded, committee based, multidisciplinary program. It began with a combination of administrative leadership and faculty expertise. The field itself is rich with theory, technology, and applications that touch architecture, engineering, health, and the arts. Opportunities for creditable faculty research abound and employment prospects for students are excellent. The enrollment is limited by admissions requirements that include an experience component and by the availability of supervision, support, and equipment. A program director shepherds the early steps but students are quickly settled in specialized areas. The degree output is steady at both the masters and doctoral level. From a review of degrees conferred in all these programs over the past ten years it is clear that there is no "bonanza" of enrollments in prospect. Indeed, that may be the nature of the graduate degree world for the forseeable future; many more programs, all of them modest in size.

d) Highly specialized degrees, particularly at the masters level, present a way of answering in very precise terms a particular market demand. (Toombs, 1973). The University of Georgia has carried this quite far with a Masters of Plant Pathology and Pest Management (MPPPM), Masters of Historical Preservation (MHP), Masters of Brand Management (MBM), a new Masters in Artificial Intelligence, and an unusually promising Masters of Avian Medicine open as advanced certification for veterinarians. Massachusetts has a Polymer Science and Chemistry specialization and Food Engineering. Arizona has a wide span of masters degrees including optics, water resources administration, toxicology, family and consumer resources, and natritional sciences. Oklahoma has a Masters in Construction Science and North Carolina, a Masters in Accounting. UCLA-Davis offers a unique answer to the situation where one

holds a degree in one specialty but wishes to add another in engineering. A program is constructed toward a Certificate of Engineering in the specialty.

The nature of external influences, what have been referred to as market factors in these pages, is not quite so specific as the abbreviated term implies. As the vice president at Illinois and the provost at North Carolina pointed out it is the broad trends, "What is naturally going on" or the rising importance of a whole class of phenomena like computers that triggers new programs.

F - FINDINGS AND CONCLUSIONS

The premises and perspectives taken here are not the usual orientations of higher education. Most often it is the institution and management of the enterprise that is examined for signs of organizational development. By looking at the other side of management, academic administration and structure, a rather distinctive picture emerges. In research universities and many other institutions there is a great deal of organizational invention going on to address environmental changes that have been building for about twenty years. The organizational forms and programs to aid adaptation have been the main focus of this study.

1 - With respect to management models the more active universities are operating in the ANALYZER mode. Most recognize two "product lines", the older discipline based degrees, traditional scholarly research, and well defined service functions on the one hand and on the other varied programs of study and certification carried out by joint degree options, committee-supervised degrees, specific practical degree designation, and new kinds of credentialing. There are two "market orientations", one a closed system approach concentrated on academic legitimacy and disciplinary expertise, the other based on exchange and collaboration with external constituencies. Evidence increases of two

organizational frameworks existing side by side in something like a modified matrix format. The traditional hierarchy of department-college-university remains but a parallel structure of centers, institutes, programs, and offices is emerging to meet environmental uncertainty and opportunity.

2 - Leadership in this "emergent social system", to use Pfeffer's term, resides with the senior academic officer, the provost or AVP. Circumstances call for a collaborative and participatory style that seeks effective means of exchange among internal experts, external bodies and individuals with practical interests, and university administration concerned with the whole institution. In some cases this exchange is so intricate that an associate provost or v.p. is needed to shepherd the effort. North Carolina, for example, has an Associate Provost for Academic Computing and Biotechnology.

3 - Joint relationships among the disciplines, what we have called multidisciplinarity in these pages, are emerging in a very different form from that reflected in academic literature. Knowledge configurations that are defined by external conditions are being established within universities and the patterns are not what academics would have put together. These new fields draw segments or subdisciplines from the departments. Since they offer rich opportunities for research, publication, recognition, and supplementation of instruction the loss of direct control is compensated. At best these multi-disciplinary units respect the ethos and values of departments but they use the essential resources and talent in a very different way, often toward very distinctive ends.

4 - Academic strategy, a strategy coming out of knowledge and its place in the contemporary society, appears to be ascendant over management strategy. The capacity of a university or college to accurately read its principal environments and then not react but interact with external constituencies is a

major advantage. This may be undertaken as a conscious strategy but more often many small strategic choices, well founded, come together to present a strategy for the enterprise. Finding strategy is as important as making strategy.

In terms of the proposition with which this paper began: Institutions are looking more to "doing the right things" but they continue to look for ways to "do things right". However, to pursue the search for "right things" they have invented new organizational units and programs, reshaped some value orientations (interdisciplinary & multidisciplinary), and generated a different leadership emphasis. The diversity in higher education is now being fed from different streams.

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